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Establishing the Reliability and Validity of a Processing Measure of Big Picture Appraisal

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Establishing the Reliability and Validity of a Processing Measure of Big Picture Appraisal

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Dedication

To my family.

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Thank you to Stephanie Rude for all of the hours spent helping me to become a professional psychologist.

Abstract

Establishing the Reliability and Validity of a Processing Measure of Big Picture Appraisal

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Three separate studies established the psychometric properties of the Scrambled Sentences Test for Big Picture Appraisal (SST-BPA), a performance measure which entails viewing difficult situations and one's reactions to them in terms of a larger context that includes perspectives such as extended time, one's broader life, and common human struggles. Study 1 established the content validity of the SST-BPA by showing that judges rated SST-BPA items as consistent with a description of the construct. In Studies 2 and 3, participants completed paper- and computer-administered versions (respectively) of the SST-BPA along with self-report measures of similar and dissimilar constructs. Item-total correlations supported internal consistency and correlations with other measures supported convergent and discriminant validity of the SST-BPA.

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Chapter 1: Literature Review

Emotions arise in reaction to internal or external stimuli and can be positive or negative. While emotions play an important role in influencing behavioral responses, decision-making, and memory, they are not always helpful. For example, emotions can occur at the wrong time or at the wrong intensity level (Gross & Thompson, 2007). In response to this, individuals have developed a natural tendency to regulate their emotions, *or attempt to influence the experience and expression of their emotions* (Gross, 1998; 2007). Importantly, emotion regulation can be done consciously or unconsciously and regulatory strategies may be automatic or controlled. Emotion regulation becomes clinically relevant upon examining its correlation with mental health: Emotion dysregulation is involved in over half of the DSM-IV Axis I disorders and in all of the Axis II disorders (Gross & Levenson, 1997). This evidence suggests that emotion regulation plays a central role in the development and maintenance of psychopathology, making it of particular importance for empirical study.

UNDERSTANDING EMOTION: THE MODAL MODEL OF EMOTION

According to Gross & Thompson (2007), three core features of emotion make up the modal model of emotion: "a person-situation transaction that compels attention, has particular meaning to an individual, and gives rise to a coordinated yet flexible multi-

system response to the ongoing person-situation transaction." This situation-attention-appraisal response sequence begins with an internal or external situation that is psychologically relevant. Regardless of the nature of the situation, it is attended to in various ways that give rise to appraisals that inform the individual's assessment of the situation's familiarity, valence, and value relevance (Gross & Thompson, 2007). Most emotion theorists agree that it is these appraisals in particular that give rise to emotional responses.

Core Features of Emotion Regulation

Individuals regulate both positive and negative emotions internally and externally. Emotion regulation occurs at five points: situation selection, situation modification, attentional deployment, cognitive change, and response modulation (Gross & Thompson, 2007). What makes each of these families unique is the point at which they occur in the emotion-generative process: the first four are antecedent focused, in that they occur before appraisals give rise to full blown emotional response. The fifth occurs after the emotional response has been triggered.

Situation Selection

This is the most forward looking approach to emotion regulation in that it involves taking actions that will make it more or less likely that we end up in situations that we expect will bring about desirable or undesirable emotions. The biggest issue with this approach is that people often profoundly over- or under-estimate the extent to which a situation will provoke an emotional response (e.g., overestimating the duration of negative emotions). Another relevant drawback to this approach is that individuals often focus on short-term benefits instead of long-term costs (e.g., a shy person avoids a social situation and feels better in the short-term, but the long-term cost of this is this is social isolation).

Situation Modification

Individuals can make efforts to directly modify a situation so as to alter its emotional impact. Essentially, situations that can potentially induce an emotional response do not always have to elicit an emotional response, at least not to the caliber we anticipate. Parents often modify situations for their children in order to reduce the likelihood of distressing emotions (e.g., helping with a frustrating game) as well as to increase experiences of positive emotion (e.g., planning an elaborate birthday party). In adults, situation modification is often in the form of assisting in problem solving or confirming the legitimacy of an emotional response in another. At its core, situation modification involves the modification of external, physical environments and efforts at

modifying internal environments in order to produce cognitive change (Gross & Thompson, 2007).

Attentional Deployment

It is very possible to regulate emotions without actually altering the physical environment. Attentional deployment has to do with how individuals direct their attention within a situation in order to influence their emotions. This is considered an internal version of situation modification and is used from infancy to adulthood, particularly when situation selection and situation modification are not possible. Attentional deployment comes in various forms, one being *distraction*, wherein an individual focuses their attention of different aspects of the situation or directs attention away from the situation altogether. It can also involve changing internal focus by calling forth thoughts or memories that are inconsistent with the undesired emotional state. *Concentration* is somewhat the inverse of distraction, in that it draws attention to emotional features of a situation. A well-known maladaptive form of attentional deployment is *rumination*, which involves repetitive focus on feelings associated with distressing events and a negative evaluation of their consequences (Bushman, 2002; Morrow & Nolen-Hoeksema, 1990). Not surprisingly, rumination has a strong relationship with depression (Gross & Thompson, 2007; Werner & Gross, 2010).

Cognitive Change

Even though cognitive change is late in the emotion-generative process, a particular emotional response is by no means set in stone. Cognitive change refers to altering our appraisal of the situation in order to alter its emotional significance. Cognitive change includes changing the way we think about the situation or changing the way we think about our capacity to manage the demands it poses. One form of cognitive change that has recently gained momentum is *reappraisal*, the veil of emotion regulation that big picture appraisal falls under. Reappraisal involves internally changing the meaning of a situation so that it alters its emotional impact. Gross & James (2007) posit that over time, reappraisal plays an important role in shaping how an individual views the self, others, and the environment.

Response Modulation

As previously mentioned, response modulation occurs after an emotional response has been initiated. It thereby refers to an individual's ability to influence the physiological, experiential, or behavioral responding as directly as possible (e.g., drugs, exercise, relaxation, alcohol, cigarettes, food). Another form of response modulation is *expressive suppression,* wherein an individual alters his or her external display of emotion, often hiding true feelings from others. It is important to consider the context of

response modulation—some ways of regulating ones emotions after the emotion has occurred may appear maladaptive, but upon consideration of the circumstances it may come clear that a "maladaptive" response was actually the only adaptive response to the particular situation (e.g., coping with an emotionally abusive family). Furthermore, it is important to consider cultural values in determining what constitutes an adaptive or maladaptive response (e.g., expressing negative emotion may be viewed by Americans as appropriately assertive, but by Nepalese adults as very inappropriate) (Gross & Thompson, 2007).

Reappraisal

Reappraisal is defined as *a form of cognitive change that involves construing a potentially emotion-eliciting situation in such a way that it changes its emotional influence* (Gross & John, 2003; Werner & Gross, 2010). Reappraisal of stressors is widely considered an adaptive emotion regulation strategy because 1) it does not demand a high level of cognitive resources and 2) because it can alter emotion-generative processes at an early stage of processing. Multiple studies have shown reduced physiological activity and distress among individuals who reappraise (Gross, 1998). Gross & John (2003) have shown that the habitual use of reappraisal to manage emotions is associated with higher levels of positive affect and lower levels of negative affect. Reappraisal has also been shown as highly associated with interpersonal functioning and

well-being and reappraisers have fewer depressive symptoms and greater self-esteem (Gross & John, 2003).

Interestingly, reappraisal can also maintain negative emotional states in other contexts. One form of maladaptive reappraisal is emotional resistance/non-acceptance of one's current emotional experience (Hayes, Luoma, Bond, Masuda, & Lillis, 2006). This type of reappraisal may play an important role in psychopathology, particularly surrounding an individual's beliefs about which emotions are okay to have and which are not (Werner & Gross, 2010). Research has found that an unwillingness to experience negative emotions and efforts to avoid those negative emotions maintain psychopathology (Hayes et al., 2006). Given this, it is important to tease out which types of reappraisal are helpful.

Big Picture Appraisal

Research thus far has shown that reappraising stressors can be helpful, but revealing which types of reappraisals are helpful is still at an early stage of development. Several labs have explored one promising approach that consists of reappraising stressors in a way that broadens one's perspective on distressing events and emotions (e.g., Kross & Ayduk, 2011; Kross, Ayduk, & Mischel, 2005; Rude, Mazzetti, Pal, & Stauble, 2011; Schartau, Dalgleish, & Dunn, 2009). We refer to the appraisal strategies used in these studies as *big picture appraisal.* We define big picture appraisal as viewing a difficult

situation and one's reactions to it in ways that transcend or go beyond the immediate perspective and view the situation in context. For current purposes, big-picture appraisal is operationally defined as maintaining awareness of how a distressing event and/or one's reactions to it fit into one or more larger contexts: (1) an extended time perspective which includes an awareness of how emotional states fluctuate and distress tends to dissipate with time; (2) the broader context of one's life, which contains both wanted and unwanted experiences; and (3) the broader human context, in which human wants and needs are fundamentally similar, and distress and fallibility are universal.

The idea of considering the broader context in the midst of distress (e.g., 'decentering,' seeing situations from multiple vantage points, and recognizing the universality of human experiences and the inevitability of negative experiences) has been imbedded in a number of approaches to psychotherapy, including traditional cognitive therapy (Beck, 2002; Dalgleish, 2004; Ehlers & Clark, 2000) and mindfulness-based variations of cognitive and behavior therapy (Brown & Ryan, 2003; Linehan, 1993; Teasdale, Segal, Williams, Ridgeway, Soulsby, & Lau, 2000) but has not been isolated as a separate component of treatment.

Self-distancing

Kross, Ayduk, and their colleagues (e.g, Kross & Ayduk, 2011) have focused on a type of reappraisal they call *self-distancing*, which is very similar to big picture appraisal

in that it requires individuals to take a larger perspective by moving away from their experience and watching it unfold as if it were happening all over again to a distant version of themselves (Kross & Ayduk, 2008). These researchers (2011) found that individuals who take this perspective while experiencing negative events or emotions experience less distress, lower physiological reactivity, and less rumination as compared to control participants instructed to adopt either a self-immersed perspective (e.g. "… relive the situation as if it were happening to you all over again" Kross & Ayduk, 2008, p. 926) or participants instructed to adopt a distraction strategy. Kross and Ayduk have interpreted self-distancing as helping individuals view distressing events in context, which is consistent with big picture appraisal.

Perspective Broadening

Additionally, Schartau, Dalgleish, and Dunn (2009) trained participants *perspective broadening*, which consists of four appraisal themes: "*Bad things happen*—bad things happen in the world, and I need to put them behind me and move on; *Silver lining*—there are usually some good aspects to every situation, and it is important to focus on these; *Broader perspective*—bad events are rare overall, and lots of good things are happening all the time; and *Time heals*—in the (near) future, this will not seem anywhere near as bad as it does now" (Shartau et al., 2009, p. 17). They found that participants who were trained in perspective broadening showed lower levels of self-reported negative emotion and electrodermal responses after watching a distressing film.

In a similar study, they asked participants to apply perspective broadening appraisal themes to distressing autobiographical memories and found reduced intrusion and avoidance of negative memories relative to control participants. Scharteau et al.'s concept of perspective broadening also appears to be almost identical to big picture appraisal.

Evidence suggests that these types of reappraisal are helpful and could potentially lead to higher levels of psychological well-being and lower levels of psychopathology. It then becomes important to have a way to measure BPA, and although a self-report measure exists, we feel that a processing measure of BPA would contribute unique information regarding BPA and our ability to detect it.

PROCESSING MEASURES AND THE SST

A processing measure can be defined simply as a measurement technique that assesses attitude on the basis of behavior as opposed to self-assessment. While it is unlikely that these types of measures provide an index of implicit attitudes, they could nonetheless provide a unique insight into various aspects of the individual (De Houwer, 2006). Furthermore, it is possible that processing measures are slightly more sensitive than self-report measures to detecting deeply held beliefs or attitudes that aren't active during the moment of measurement. In order to understand how a processing measure of BPA (in this case, the SST-BPA) would potentially be able to bypass self-distortion and get at a truer picture of an individual's attitude toward him- or herself in the face of

distressing events or emotions, one must first understand the origin and development of the original Scrambled Sentences Test, an established processing measure designed to detect cognitive vulnerability to depression (SST; Wenzlaff & Bates, 1998).

Development of the Original SST

It is well established that depressed individuals tend to focus their attention on unhappy and unflattering information, to interpret ambiguous information negatively, and to harbor pervasively pessimistic beliefs (e.g., Hamilton & Abramson, 1983; Hollon, Kendall & Lumry, 1986; Krantz & Rude, 1984; Rude, Krantz, & Rosenhan, 1988). However, these information-processing biases are also easily explained as symptoms or effects of depression (e.g. Coyne & Gotlib, 1983; Hammen, Marks, deMayo, & Mayol, 1985).

Countering the claim that information-processing biases observed in depression are nothing more than a concomitant of depression, cognitive depression theorists such as Beck (e.g. Beck, 1967) posit that negatively biased schemata of self, world, and future bring about the symptoms and phenomenology of clinical depression. Depressive schemata are presumed to become latent upon symptomatic recovery from a depressive episode, yet to remain available, constituting a vulnerability to subsequent episodes of depression (Rude, Covich, Jarrold, Hedlund, & Zentner; 2001). Even though an individual appears to be recovered from depression, he or she may still harbor dormant

depressive schemata that could potentially be reactivated upon experiencing a stressful life event and propel the individual into another depressive episode.

Over the past two decades, in order to either explain or reject Beck's (1967) theory, an important goal of depression researchers has been to clarify the role of underlying depressive schemata and negative cognitive biases in bringing about depressive episodes. In order to do this, researchers would need to show group differences in depressive biases between formerly-depressed and never-depressed individuals. Researchers focused on these two groups because never-depressed individuals are presumed to be mostly free of depressive biases (and therefore at low-risk for depression) and formerly-depressed individuals could potentially harbor these depressive biases (and therefore be at-risk for depression). The hypothesis was that formerly-depressed individuals would show higher scores on measures of depressive thinking than never-depressed individuals in order to prove that negative cognitive biases play a role in the development and maintenance of depression.

While a large body of research successfully established that currently-depressed individuals show negatively biased information processing, it was initially more difficult to detect these specific group differences of depressive biases in never-depressed and formerly-depressed individuals. Both never-depressed and formerly-depressed individuals consistently scored similarly on self-report measures of depressive thinking (e.g. Bradley & Matthews, 1988; Eaves & Rush, 1984; Gotlib & Cane, 1987; Hamilton & Abramson, 1983; Persons & Rao, 1985; Silverman, Silverman, & Eardley, 1984; and

Wilkinson & Blackburn, 1981). This finding didn't support Beck's claim that cognitive biases play an important role in depression as hypothesized. In order to explain this difficulty, Hedlund and Rude (1995) suggested that an additional reason that detection of depressive biases among formerly-depressed individuals has been elusive may be the use of relatively insensitive (self-report questionnaire) measures of depressive thinking in most studies.

Consistent with existing research, Hedlund and Rude (1995) found that formerly and never-depressed individuals did not differ on two widely used questionnaire measures of depressive thinking, the Dysfunctional Attitudes Scale (DAS; Weissman & Beck, 1978) and the Automatic Thoughts Questionnaire (ATQ; Hollon & Kendall, 1980). However, these groups did differ on a processing measure of interpretation: formerly depressed participants produced more negative solutions on the Scrambled Sentences Test (SST; Wenzlaff, 1993). These results suggested that the SST was potentially sensitive enough to tap into elusive processes and detect underlying depressive biases.

Importantly, the scrambled sentences that the measure consists of are traditionally administered in two separate sets (e.g., in blocks of 10 to 20) to participants—one set under a time limit (e.g., three minutes) *and* a cognitive load and one set only under a time limit. The 6-digit number is shown to participants for a few seconds directly prior to beginning the task, and they are asked to hold the number in memory while unscrambling the sentences and to write it down when time is up. Ideally, participants feel that remembering the number an important part of the test and dedicate a significant amount

of cognitive resources to keeping it in mind. Although both ways of administering the scrambled sentences are thought to reduce volitional control in responding (i.e., the act of unscrambling sentences also uses up cognitive resources) the addition of a cognitive load in the form of a 6-digit number functions to further decrease an individual's capacity to unscramble sentences in a manner that is consistent with how one *wishes* to be viewed.

Researchers hypothesized that the score for the set of sentences that were administered only under a time limit would be more correlated with questionnaire scores and not be as sensitive to detecting group discrepancies in depressive thinking (Hedlund & Rude, 1995). On the other hand, the score for the set of sentences administered under a cognitive load and a time limit would presumably 1) differ from the score for the set of sentences administered with no load and 2) be less correlated with questionnaire measures, because it would ideally be more sensitive to detecting depressive biases. Rude, Valdez, Odom, & Ebrahimi (2003) found these differences in the load and no-load version of the measure, with the load version being a stronger predictor of subsequent depression.

The Uniqueness of Processing Measures and the SST

There are many possible reasons that a processing measure like the SST could access depressive biases, or underlying cognitive processes in general, whereas self-report measures could not. In order to understand this phenomenon, it is first necessary to

explore the nature of questionnaire measures. Questionnaires are particularly susceptible to distortion because they are self-report in nature and presumably require a high degree of psychological awareness on the part of the respondent to be of use to the researcher. Robinson and Neighbors (2012) suggest that *self-report measures capture the mind as an object of self-reflection* while processing measures *capture the mind in action*.

Given that the SST is a processing measure, evidence suggests that it may be more sensitive to detecting formerly elusive cognitive processes, whether those processes are related to depressive thinking or styles of emotion regulation. This is likely because the SST is more reflective of individuals' true attitudes because they do not have the cognitive capacity necessary to "choose" their answers as they would in a self-report measure. In support of these hypotheses, Hedlund and Rude's study (1995) where group differences between never-depressed and formerly-depressed individuals were found using the SST was followed by numerous later studies that continued to produce similar and even more striking results (Rude et al., 2001; Rude, Valdez, Odom, & Ebrahimi, 2003).

Rude et al. (2001) again found that differences is depressive thinking as a function of depressive history (never-depressed and formerly-depressed) were revealed by two laboratory tests, but not by the questionnaires. Rude et al. (2003) found that SST scores (proportion of negative solutions) in the cognitive load condition predicted diagnoses of major depression during an 18-28 month follow-up period. No significant prediction of depression was obtained using SST scores from the no-load portion of the task. A recent

study (Rude, Durham-Fowler, Baum, & Maestas, 2010) repeated this procedure and found that a self-report measure, the Dysfunctional Attitudes Scale (Weissman and Beck, 1978), and a cognitive processing test, the Scrambled Sentences Test (Wenzlaff, 1993), each contributed significantly to predicting a subsequent diagnosis of MDD.

Evidence from these studies suggests that processing measures are particularly sensitive to the unique processes generated by each individual (Barton, S., Morley, S., Bloxham, G., Kitson, C., Platts, S., 2005). Robinson & Neighbors (2012) go on to argue that performance measure cannot be faked as easily, or at least not in any obvious way, which makes them an ideal "check" on conscious patterns of self endorsement). Supporting the theory behind the SST and detection of depressive biases, Robinson & Neighbors (2012) posit that processing measures should not be seen as tapping into the same constructs, or aspects of the person, as those tapped by self-report measures.

This could also explain why scores on the SST typically do not correlate highly with self-report measures of depressive thinking and why it is difficult to establish convergent validity for the SST-BPA. The only other measure of BPA (BPAQ; Gill, 2014) is self-report in nature, meaning it could be accessing different parts of the individual than the SST-BPA. It makes sense, then, that the SST-BPA and the BPAQ do not show as strong of a correlation as would be expected of two alternate measures of the same construct (Campbell & Fiske, 1959). Furthermore, it is inherently difficult to produce adequate reliability and validity for a processing measure (for a discussion, see Cunningham, Preacher, & Banaji, 2001). For example, different measures of attention to

threat do not tend to be correlated (Kindt & Brosschot, 1998; Mogg, McNamara, Powys, Rawlinson, Seiffer, & Bradley, 2000). Given this, the correlation between the alternate measures of BPA appears acceptable.

Present Study

The present study aims to integrate the theory behind emotion regulation, big picture appraisal, and processing measures in order to produce a Scrambled Sentences Test for Big Picture Appraisal that contributes unique information to the construct of BPA, in addition to what self-report measures are able to tell us.

Chapter 2 : Establishing the Reliability and Validity of a Processing Measure of Big Picture Appraisal

Although there has been considerable recent interest in the types of appraisals that are effective in regulating emotion, measurement of these appraisal styles is lacking. The current paper focuses on a distinct type of appraisal, *big picture appraisal,* and presents a new measure of this appraisal style. We define big picture appraisal as viewing a difficult situation and one's reactions to it in ways that transcend or go beyond the immediate perspective and that consider the situation in context. More specifically, big picture appraisal is defined as maintaining awareness of how a distressing event and/or one's reactions to it fit into: (1) an extended time perspective which includes an awareness of how emotional states fluctuate and distress tends to dissipate with time; (2) the broader context of one's life pursuits, in which there are typically alternate routes to meet one's most important goals, and sometimes unexpected benefits of setbacks, (3) the broader human context, in which human wants and needs are fundamentally similar, and distress and fallibility are universal (Rude, Gill, Miller, & Haner, 2013).

Supporting the concept and usefulness of big picture appraisal, Rude, Mazzetti, Pal, and Stauble (2011) found that college students who reported a recent interpersonal rejection experienced lower levels of rumination after receiving an experimental big picture intervention (i.e., writing in response to probe questions that encouraged considering how they would feel about the experience in 1-2 years, how their responses were similar to those of other people, and how a neutral observer might view the

situation) as compared to either of two control interventions (writing about the reasons for the events and their reactions to it or not writing about their experience at all). Further support comes from a study by Miller, Rude, and Haner (in press) in which a bias toward big picture appraisal was trained implicitly, using cognitive bias modification techniques (e.g., MacLeod & Mathews, 2012). In the Miller et al. (in press) study, training resulted in the expected group differences on an early version of the measure studied here, the Scrambled Sentences Test for Big Picture Appraisal (SST-BPA), as well as a trend toward greater emotional balance (lower negative mood) following a stressor in the big picture as compared to the control condition.

Several other research programs have shown the benefits of taking a larger perspective, including Schartau, Dalgleish, and Dunn (2009) who proposed the importance of *perspective broadening*. In a series of studies, participants encouraged to practice *accepting that bad things happen, finding a silver lining, taking a broader perspective*, and *remembering that time heals*, showed lower levels of self-reported negative emotion and electrodermal responses after watching a series of distressing films than control participants. Additionally, Kross and Ayduk (e.g. Kross & Ayduk, 2011; Kross & Ayduk, 2008; Ayduk & Kross, 2010) have found that individuals instructed to take a *self-distanced* perspective on a distressing event (e.g. "…take a few steps back and move away from your experience…watch the experience unfold as if it were happening all over again to the distant you…" Kross & Ayduk, 2008, p. 926) experienced less distress, lower physiological reactivity, and less rumination than individuals who took a

self-immersed perspective (e.g. "… relive the situation as if it were happening to you all over again" Kross & Ayduk, 2008, p. 926) or who adopted a distraction strategy.

Given research interest in emotion regulation strategies such as big picture appraisal (BPA), developing a measure of BPA could be useful for research as well as for practical applications. Currently, a self-report measure of BPA (BPAQ; Gill, 2014) is in development, and although this type of measure is needed, self-report measures are inherently vulnerable to particular types of distortions that can be explained by a number of relatively natural tendencies—including self-deceptive positivity and a desire to respond in a socially desirable manner (Paulhus & Jon, 1998; Shedler, Mayman, & Manis, 1993). Furthermore, considerable evidence indicates that individuals do not have full access to their own cognitive processes (e.g., Nisbett and Wilson, 1977) and consequently cannot self-report with complete accuracy. These tendencies can detract from the validity of self-report measures. A *performance* measure such as the measure described here, which assumes that many of a person's most important tendencies are revealed only by observing how they are enacted, may be able to bypass these problems that are often seen in self-report measures and therefore get a "truer" or more dynamic picture of a person's attitude (Robinson & Neighbors, 2012).

The current paper describes the development and preliminary validation of a performance measure of BPA, the Scrambled Sentences Test for Big Picture Appraisal, wherein participants unscramble sentences under time pressure to yield coherent statements reflecting a big picture or a non big picture perspective. The SST-BPA was

modeled after an established measure of depressive biases, the Scrambled Sentences Test (SST; Wenzlaff, 1988, 1993, 1998), which has shown evidence of superiority to self-report measures in distinguishing individuals with and without a history of depression (Hedlund & Rude, 1995; Rude, Covich, Jarrold, Hedlund, & Zentner, 2001) and of predicting the occurrence of depression prospectively (Rude, Odom, Valdez, & Ebrahimi, 2003; Rude, Durham-Fowler, Baum, Rooney, & Maestas, 2010).

In three separate data collections the reliability and validity of the SST-BPA was assessed. Study 1 examined the content validity of the draft SST-BPA items, and Study 2 and Study 3 assessed the internal consistency and convergent-discriminant validity of the measure. Whereas Study 2 used a paper and pencil implementation, parallel to that used with the original SST, Study 3 examined the psychometric properties of a computerized implementation of the SST-BPA.

Development of the SST-BPA

The format and structure of the SST-BPA is identical to the original scrambled sentences test. As in the original SST, items developed for the SST-BPA were groups of 6 words that respondents unscramble by placing numbers above each of five of the words to reflect the chosen word ordering. A non emotional example used in instructions for the task is, "hot water cold is sometimes very"), which can be unscrambled to form the sentences, "water is sometimes very hot" or "water is sometimes very cold." The way a person unscrambles a sentence is thought to indicate the meanings that are most accessible to him/her. A final score is computed as the ratio of each type of solution

(depressive or non depressive in the original SST) divided by the total sentences completed. To further decrease the use of volitional control in responding, items can be administered under cognitive load (maintaining a 6-digit number in memory while completing the items). The 6-digit number is briefly presented to subjects directly prior to unscrambling a block of sentences, and at the end of each block participants are asked to write the six-digit number in the space provided.

A large pool of preliminary items was constructed by the authors. Items were developed to reflect the three key dimensions of BPA as described above: an extended time perspective, the broader context of life, and the broader human context (Rude et al., 2013). Potential items were reviewed and revised by the authors and colleagues for clarity and consistency with the BPA concept, and 40 items were selected as meeting initial criteria with the anticipation that poorly functioning items could be removed later (see Clark & Watson, 1995).

STUDY 1

Method

The purpose of Study 1 was to establish the content validity of the draft SST-BPA items. The interest was in the degree to which solutions to the items were judged to actually reflect the researchers' definition of big picture appraisal.

Sample and Procedures

In two online surveys (n=17; n=18), completed by mental health professionals and

psychology graduate students, participants first read a written description of the big picture construct ("*Big picture appraisal is defined as individuals' ability to see their current distress in a larger context. This means that in the face of situations going badly and when feeling difficult emotions, they are able to have a larger perspective on themselves and their situation—to see "the big picture." This would include being able to realize that feelings come and go and that distress doesn't last indefinitely. It would also involve viewing the distressing event or emotions within the broader context of their life. It might involve realizing that life has many aspects and that they are not alone in their distress. The opposite of this kind of thinking is having mental "blinders" on during a distressing event and not being able to see anything but the distress—not being able to see the other pieces of the puzzle*") and then judged how much the big picture and the non-big picture solutions for each item captured big picture thinking. The complete set of items was divided into two subsets and administered in separate surveys to minimize fatigue effects, since the number of statements to rate was large (two for each of the 40 scrambled sentence items). Administration was randomized with an equal number of participants receiving each survey. Within each survey, the big picture and non big picture solution for each item were intermixed so that the solutions for a given item did not appear close together. Participants rated each solution on how much it expressed a view that took the big picture into account, 1 being "not at all" and 5 being "very much."

Results and Discussion

For ease of interpretation, the original response scale of 1 to 5 is presented here as -2 to 2, with a midpoint of zero so that negative numbers reflect mean ratings below the scale midpoint, suggesting the item is not judged as reflecting big picture appraisal, whereas positive numbers reflect means above the scale midpoint, suggesting the item is judged as reflecting this construct. The first column in Table 1 shows that the mean ratings of all big picture solutions were positive (more reflective of big picture thinking) and the second column shows that the mean ratings of all but five non-big picture solutions were negative (less reflective of big picture thinking). These five items were omitted from further analysis in Study 2 and Study 3 due to not being clearly reflective of either big picture or non-big picture thinking. Thus the results suggested that the remaining 35 items are broadly consistent with the big picture construct as we have described it.

STUDY 2

Study 2 sought to establish psychometric properties of the SST-BPA by administering it to a large sample of undergraduates, along with measures of similar and dissimilar constructs. The SST-BPA was administered using the traditional paper and pencil format as described below. In some uses of the original SST, items are often administered under cognitive load (asking participants to hold a 6 digit number in mind while completing the task). In the current study we were initially interested in exploring whether differences would emerge between load and no load versions of the task. Hence,

half of the BPA-SST items were administered under load and half without (order counterbalanced). Correlations of total SST-BPA scores with related and unrelated measures were used to assess convergent-discriminant validity. These measures included the self-report big picture questionnaire that is currently under development, a measure of self-compassion, emotion regulation, and a measure of the big five personality dimensions (all described below).

Our predictions for how SST-BPA scores would correlate with other measures was as follows: Since big picture thinking is thought to help regulate negative emotion, we expected to see a low inverse correlation with the use of an alternative emotion regulation strategy that has been demonstrated to be relatively ineffective (Gross & John, 2003), emotion suppression. We expected a relatively high degree of association with self-compassion because the theory of self-compassion (see Neff, 2003) emphasizes the idea of human interconnection and of viewing one's difficulties from an optimal distance, ideas that are similar to two key aspects of big picture thinking. We expected a positive association with reported tendency to use reappraisal as an emotion regulation strategy because we conceptualize big picture thinking as a type of reappraisal. Because we view big picture thinking as an effective emotion regulation strategy, we expected it to be moderately negatively related to neuroticism. We expected low to moderate positive relationships between big picture thinking and the remaining "big five" personality dimensions of agreeableness, conscientiousness, openness, and extraversion. John, Naumann, and Soto (2008) describe agreeableness (prosocial behaviors and attitudes) as

a tendency to be altruistic and sympathetic, which we suspect may naturally emerge from a sense of feeling connected to others. Our expectations for conscientiousness, openness to experience, and extraversion were less certain but we thought big picture thinking might show a low to moderate positive correlation with conscientiousness, as conscientiousness in this sense is described as the tendency to think before acting (John et al., 2008), which could be associated with considering the context of distressing events and/or one's emotional reactions. A low to moderate positive association with openness to experience seemed possible as this construct reflects a generally curious and reflective outlook (John et al., 2008), which might be expected to yield a big picture perspective; and a similar association with extraversion seemed possible, as this construct encompasses positive emotionality (John et al., 2008) and because it seems conceptually linked to feeling connected with others, an important aspect of big picture thinking.

Finally, we anticipated the strongest association to be between the SST-BPA and the self-report measure of big picture appraisal (BPAQ; Gill, 2014) because it purports to measure the same construct. However, given the fairly significant differences in the structure and content of the two measures, the association was not expected to be as high as it would be between two self-report measures of the same construct.

Method

Sample and Procedures

Undergraduates at The University of Texas at Austin (*N=205, 58% women*) were recruited from an Educational Psychology subject pool and received class credit in

exchange for completing the survey. Participants self-identified as being of the following descents: Hispanic (*N=60*), African-American/Black (*N=3*), Asian (*N=47*), European (*N=122*), Multiracial (*N=9*) and other (*N=8*). Participants ranged in age from 18 to 46 with an average age of 21.

Participants first completed the SST-BPA in groups of 3-6 people. After completing the SST-BPA, participants were directed to a computer lab in which they completed an online survey consisting of a measure of big picture appraisal, the big 5 personality traits, self-compassion, and emotion regulation, respectively (described below). The entire session took approximately 40 minutes to complete.

Instruments

Scrambled Sentences Test for Big Picture Appraisal (SST-BPA). Participants completed one of two alternate forms (randomly determined) of the SST-BPA. In both forms, items were administered in blocks of ten and participants were given 1.5 minutes to unscramble each block. The only difference in the forms was the ordering of items (i.e., item 1 in the first form became item 40 in the second, item 2 became item 39, and so on) and whether the first two blocks or second two blocks of items were completed under cognitive load. Table 1 lists the items in the order they appeared on one of the two forms. Like the original SST, scoring of the SST-BPA is done by judges. In this case, judges were undergraduate and graduate students who received training (e.g., practice exercises, expert feedback) in scoring the SST-BPA prior to the study. While many of the solutions produced are anticipated (as shown in Table 1), respondents sometimes unscramble in

unanticipated ways that still convey a big picture or a non-big picture meaning and are therefore scorable. Solutions are considered unscorable if the sequence of words does not form a grammatically correct sentence (e.g., "fear can I learn from") or if the sentence formed is neither a clear big picture or non big picture solution, or if (contrary to instructions), it forms a question (e.g., "can I learn from fear"). Each item was independently scored by two judges and inter-rater reliability was high (r = .96). Any scoring discrepancies that occurred were resolved by discussion between judges and the first author.

Demographic Questionnaire. The authors included questions about age, sex, and racial group.

The Emotion Regulation Questionnaire (ERQ; Gross & John, 2003) consists of ten items designed to assess individual differences in the habitual use of two emotion regulation strategies: *cognitive reappraisal* and *expressive suppression*. Items are rated on a 7-point scale ranging from strongly disagree to strongly agree. Examples of suppression items include "I keep my emotions to myself" and "I control my emotions by not expressing them," and examples of reappraisal items include "When I want to feel a more positive emotion (such as joy and amusement), I change what I'm thinking about" and "I control my emotions by changing the way I'm thinking about the situation I'm in." Alpha-levels for the suppression subscale and the reappraisal subscale were .73 and .79, respectively. Test-retest reliability across three months was .69 for both subscales (Gross & John, 2003).

The Big Five Inventory (BFI; John, Donahue, & Kentle, 1991; John, Naumann, & Soto, 2008) is a 44-item self-report measure of the five major facets of personality, which include extraversion (e.g., "I am someone who is talkative, full of energy"), agreeableness (e.g., "I am someone who is relaxed, handles stress well"), conscientiousness (e.g., "I am someone who is a reliable worker, organized"), neuroticism (e.g., "I am someone who worries a lot, can be tense"), and openness (e.g., "I am someone who has an active imagination, is curious"). Items are rated on a scale of 1 to 5, ranging from "strongly disagree" to "strongly agree." Internal consistencies for each sub-scale are as follows: extraversion, .86; agreeableness, .79; conscientiousness, .82; neuroticism, .87; and openness, .83 (John et al., 2008).

The Self-Compassion Scale (SCS; Neff, 2003) is a self-report measure designed to assess one's level of self-compassion. It consists of 26 items that were written to fall into three categories: self-kindness (i.e. "I try to feel loving towards myself when I am in emotional pain), common humanity (i.e. "When things are going badly for me, I see the difficulties as part of life that everyone goes through"), and mindfulness (i.e. "When something upsets me I try to keep my emotions in balance"). However, use of the total score has been recommended (Neff, 2009). The measure was found to have a high level of internal consistency with a Cronbach's alpha of .92 (Neff, 2003).

The Big Picture Appraisal Questionnaire (BPAQ; Gill, 2014) is a self-report measure consisting of 23 likert type items. Instructions ask respondents to indicate how they typically respond when experiencing distressing situations. Items were written to tap

awareness of extended time perspective, commonality of human experience, inevitability of unwanted life experiences, and the possibility for growth and learning from adversity. However, exploratory factor analysis indicates a single factor. Although this measure is still in development, preliminary data indicate acceptable convergent-discriminant validity and internal consistency with alpha = .90 (Gill et al., 2013).

Results and Discussion

Item Statistics. Because scoring of each individual SST-BPA item is dichotomous, internal consistency reliability was assessed using point-biserial item-total correlations rather than Cronbach's alpha. Table 1 shows the item-total correlations and the frequency of big picture and non-big picture solutions for each item. As can be seen from the table, the *n* for each item ranged considerably. This is an expected result of the timed format in which many participants aren't able to complete items presented closer to the end of a block. A widely used rule of thumb for acceptable levels for item-total correlations is .2 or .3 (Everitt, B., 2002). SST-BPA item-total correlations ranged from .25 to .63, with the exception of five items (item 4, $r = .09$; item 6, $r = .16$; item 7, $r = .07$; item 27, $r = .13$; item 36, $r = .10$). These five items were subsequently omitted from the item-total because they did not appear to be reliably measuring the same construct as other items in the block. Importantly, the relatively high rate of unscorable solutions for item 4 (21%) and 7 (26%) likely contributed to their lack of correlation with item totals.

The fifth column of Table 1 presents the percentage distribution of big picture and non-big picture responses to each item, and the difference between the sum of the two

percentages and 100 indicates the percent of unscorable solutions for each. The majority of items weren't solved in one way too frequently, indicating that these items were able to discriminate fairly well between appraisal styles. However, item 32 received zero non big picture responses, raising questions about its ability to discriminate styles. It was subsequently omitted from the pool of items.

Table 1 shows item-total correlations in column 3 only for the 29 items that were used in calculations.

Validity of Total Scores. For the remaining 29 items, three separate SST-BPA scores (ratios) were calculated: A ratio corresponding to 1) items completed under a load, 2) items completed without a load, and 3) both types of items combined). Scores were calculated by creating a ratio of the number of big picture solutions over total items completed correctly (i.e., excluding error solutions), as has been done in previous studies using the original SST (e.g., Rude et al., 2003). For items completed under load, means for the number of big picture solutions, total items completed, and ratio (with standard deviations in parenthesis) were 5.33 (3.36), 8.00 (4.14), and .65 (.23), respectively. For items completed without load, means (with standard deviations in parenthesis) for the number of big picture solutions, total items completed, and ratio were 5.86 (3.93), 7.89 (4.25), and .72 (.21), respectively.

Table 2 presents correlations relevant to assessing convergent and discriminant validity. Correlations of each measure with the portions of the SST-BPA administered with and without cognitive load, as well as the combined are given. Since the pattern of

correlations does not appear to vary in general as a function of load administration, only correlations with the combined version of the SST-BPA will be discussed. As can be seen, the pattern of correlations is generally consistent with predictions. As expected, the SST-BPA was moderately associated with the Self Compassion Scale (SCS) and the Big Picture Appraisal Questionnaire (BPAQ). Although SST-BPA is more associated with the BPAQ than the SCS, the correlation with the BPAQ was not quite as high as was hoped. The SST-BPA was somewhat associated with the reappraisal subscale of the Emotion Regulation Questionnaire but less so than expected, and it was mildly to moderately associated with the agreeableness, extraversion, conscientiousness, and openness subscales of the Big Five Inventory (BFI-A; BFI-E; BFI-C; BFI-O). As anticipated, it showed relatively little association with the neuroticism subscale (BFI-N), but it was moderately inversely correlated with neuroticism when administered under a cognitive load. Although we expected an inverse correlation with the expressive suppression subscale of the Emotion Regulation Questionnaire (ERQ-S) the correlation was essentially zero, indicating that the two constructs are relatively unassociated.

STUDY 3

Study 3 was nearly identical to Study 2 in structure and purpose but had the additional goal of evaluating the psychometric properties of a computer administration of the SST-BPA. Instead of writing the numbers 1 through 5 below each word to indicate ordering as in the paper administration, the computer administration presented

participants with each scrambled sentence and instructed them to type the numbers 1 through 5 in a text box below each word to indicate ordering. Items were presented to all participants in the order they appear on Table 1 and participants were given 1.5 minutes to unscramble each block of ten sentences. Half of the participants completed the first two blocks of items under load and the other half completed the last two blocks of items under load. Pilot testing indicated that respondents found this administration/response format manageable but somewhat more demanding of effort than the paper and pencil format. Predictions for the pattern of correlations were the same as described above for Study 2. In addition, we included a measure of social desirability that we expected to be essentially uncorrelated with the SST-BPA, especially when administered under a cognitive load.

Method

Sample and Procedures

Undergraduates at The University of Texas at Austin (*N=540, 63% women*) were recruited from an Educational Psychology subject pool and received class credit in exchange for completing the survey. Participants self-identified as being of the following descents: Hispanic (*N=146*), African-American/Black (*N=4*), Asian (*N=102*), European (*N=257*), Middle Eastern (*N=9*), Multiracial (*N=12*) and other (*N=10*). Participants ranged in age from 18 to 56 with an average age of 21.

Participants accessed and completed the survey online, and it took approximately

40 minutes to complete. Participants completed the same measures used in Study 2 (see above for descriptions) but the order of administration was different. Participants first completed a measure of big picture appraisal, social desirability, and big 5 personality traits before completing the SST-BPA. Then, participants completed measures of self-compassion and emotion regulation.

Instruments

The Marlowe-Crowne Social Desirability Scale- Short Form C (MC-C; Reynolds; 1982) is 13-item shortened form of the Marlowe-Crowne Social Desirability Scale (MCSD; Crowne & Marlowe, 1960). The MCSD is used as an adjunct measure of the impact of social desirability on self-report instruments. Items are answered either "true" or "false" and examples of items include "I can remember playing sick to get out of something" and "I am always courteous, even to people who are disagreeable." Items are summed for the total score (5-items are reverse scored), with increasing scores reflecting participants' desire to answer in a more socially acceptable manner. It has been found to have good internal consistency (KR-20=.76; Reynolds, 1982).

Results and Discussion

Item Statistics. As indicated in Table 1, analyses of Study 3 data yielded a similar pattern to that observed for Study 2 for item-total correlations and distribution of responses for each item and provided further evidence for the adequacy of these items. The full set of 40 items was administered in Study 3 in order to compare item performance with Study 2. BPA item-total correlations ranged from .24 to .57, with the

exception of three items (e.g., item 4, r = .10; item 7, r = -.07; item 14, r = .12). Whereas items 4 and 7 showed similarly low item-total correlations in Study 2, item 14 performed fairly well in Study 2. However, based on Study 3 reliability, item 14 was also omitted. This resulted in a final pool of 28 items.

As in Study 2, the timed design of the measure contributed to large variability in the number of responses to each item but this variability was considerably larger in Study 3 than in Study 2 because only a single item ordering was used in Study 3. Because of the single item ordering each item in a block of ten items typically received fewer responses than the item before it. This can be seen in the pattern of Ns shown in parentheses in the 5th column in Table 1.

Column 6 shows that, as in Study 2, the items vary in their ability to discriminate between different degrees of big picture thinking. Only item 22 showed a markedly skewed response pattern, with only 2 non big picture responses. The six items (items 7, 14, 15, 26, 32, and 36) that showed high rates (25%) of unscorable solutions in Study 2 performed similarly in Study 3, with six additional items (items 8, 9, 10, 19, 30, and 38) also yielding unscorable solutions more than 25% of the time. Importantly, all of these items were each at the end of a set of sentences and increased time pressure could have been partially responsible for the number of unscorable solutions.

Validity of Total Scores. As in Study 2, total SST-BPA scores were created separately for the half of the items each participant had completed under load and the half of the items completed without load and scores were calculated by creating a ratio of the

number of big picture solutions over total items completed correctly (i.e., excluding error solutions). For items completed under load, means (with standard deviations in parenthesis) for the number of big picture solutions, total items completed, and ratio were 8.02 (3.55), 10.52 (3.65), and .77 (.18), respectively. For items completed without load, means for the number of big picture solutions, total items completed, and ratio were 8.02 (3.55), 10.51 (3.65), and .75 (.20), respectively.

As can be seen in the third through sixth columns of Table 2, the pattern of correlations with other measures was similar to that observed for Study 2 and generally consistent with predictions. As in Study 2, the SST-BPA showed a moderate positive association with the BPAQ and the SCS and no association with the ERQ-S. It showed similar associations with the BFI subscales as in Study 2, with the exception of being essentially uncorrelated with BFI conscientiousness when administered under cognitive load and showing a moderate inverse association with the BFI-N both when administered with a cognitive load and without. The SST-BPA was slightly more correlated with the ERQ-R than in Study 2 and showed a mild positive association with social desirability when administered without a cognitive load, but the correlation became essentially zero with the introduction of the cognitive load, suggesting that the cognitive load may further limit the use of volitional control in the SST-BPA.

SUMMARY AND CONCLUDING DISCUSSION

The results of the three studies reported here suggest that the Scrambled

Sentences Test of Big Picture Appraisal (SST-BPA) is psychometrically sound and a valid measure of big picture thinking. Big picture appraisal views difficult life circumstances within a broader context that considers alternate avenues to goal fulfillment in the face of setbacks as well as positive aspects of adverse situations, commonality with experiences of other people, and a relatively large time perspective. Recent evidence indicates that big picture appraisal (Miller et al., in press; Rude et al., 2011) as well as similar appraisal strategies such as perspective broadening (Schartau et al., 2009) and self-distancing (Kross & Ayduk, 2008, 2011; Ayduk & Kross, 2010) are beneficial in the regulation of emotion. While a number of recent experimental studies have supported the benefits of these approaches, very little work has addressed the measurement of individual differences in adaptive appraisal strategies. Present results indicate that the SST-BPA will be a useful tool for the investigation of big picture appraisal.

Study 1 established the content validity of the SST-BPA by assessing the degree to which item solutions appear to reflect big picture appraisal. Overall, item solutions were rated in the expected direction (i.e., positively for big picture and negatively for non-big picture). The fact that judges who had no prior knowledge of big picture appraisal, using only a brief description of the construct, rated the solutions consistently with the intended big picture and non big picture solutions for each item lends important support for our claim to have tapped into big picture appraisal as we have described it.

Study 2 and Study 3 established the reliability and validity of the SST-BPA.

Notably, measures were administered in a different order in Studies 2 and 3 and the SST-BPA may have effects, such as decreased attentional resources or negative distress, which may influence participants' responses to measures that follow the SST-BPA in Studies 2 and 3. Furthermore, Study 2 was administered on paper and Study 3 on a computer. Despite these two differences, the results in both studies were similar. Across both studies, the vast majority of items demonstrated adequate internal consistency, and items that performed especially well in Study 2 also tended to perform well in Study 3. Analyses also revealed that the there is an adequate spread between big picture and non-big picture responses for the majority of items, suggesting that items are able to discriminate fairly well between appraisal styles.

For six items across both Studies 2 and 3, item-total correlations were less than the widely used threshold of .2 or .3 (Everitt, B., 2002). While this may be a limitation for these items, it may also be due to the fact that performance measures are especially sensitive to the unique responses generated by each individual (Barton, Morley, Bloxham, Kitson, & Platts, 2005) and consequently it is more difficult to obtain adequate psychometric properties for performance than self-report measures. For example, word fragment completion measures rarely approach the internal consistency of self-report tests (Buchner & Wippich, 2000; McCleland, 1987). Nonetheless, these items were omitted from the final pool of items, along with five items that did not demonstrate adequate content validity and one item that did not discriminate between appraisal styles (i.e., it received zero non big picture responses). Based on our criteria a total of 12 items

were omitted, leaving a final number of 28 items with acceptable psychometric properties.

As anticipated, the SST-BPA was the most correlated with the BPAQ and the SCS, since the former purports to measure the same construct and the latter shares fundamental similarities with BPA, like common humanity. The association between the SST-BPA and BPAQ suggests that the measures are moderately related to one another but less so than one might expect of alternate measures of the same construct. This might be because they utilize vastly different measurement techniques, and more specifically because performance tests are generally not highly correlated with other measures of the same construct (e.g, different measures of attention to threat do not tend to be correlated) (Kindt & Brosschot, 1998; Mogg et al., 2000; Cunningham, Preacher, & Banaji, 2001). Robinson & Neighbors (2012) suggest that this might be partially because performance measures can often bypass the distortion (i.e, self-deceptive positivity, social desirability) that arises in self-report measures. Given this, the present correlation between alternate measures appears acceptable. Importantly, the weak to non-existent associations between the SST-BPA and the measure of social desirability suggest that these findings are not due to participants answering the big picture appraisal items in either a socially desirable or undesirable manner, particularly in when the measure is administered under cognitive load.

Given that BPA is a unique construct that falls under the broader category of reappraisal, the minimal to moderate correlations with reappraisal make sense. In the

ERQ, reappraisal is conceptualized as the tendency to change ones thoughts in order to change ones feelings (e.g., "When I want to feel a more positive emotion, I change what I'm thinking about) (Gross & John, 2003). BPA is distinct from this form of reappraisal in that it focuses on *considering the context* of distressing situations and emotions as opposed to changing ones thoughts in a broader sense. We also anticipated an inverse association between the SST-BPA and expressive suppression because it is considered an ineffective way of regulating emotions; however, the two measures were uncorrelated in both Study 2 and Study 3, providing adequate evidence that the two constructs are unrelated. This makes sense, given that BPA emphasizes *the internal regulation of emotions via reappraisal of the meaning of distressing thoughts, feelings, and situations* and expressive suppression emphasizes *the regulation of external displays of emotion*, suggesting that the two constructs address different aspects of emotion regulation.

The SST-BPA showed a range of relationships with the subscales of the BFI. As predicted, it was minimally to moderately correlated with neuroticism (inversely) and extraversion, suggesting that individuals who often experience positive emotions, enthusiasm, and energy and who are emotionally stable tend to view their distressing experiences in terms of the bigger picture. Given that an important component of BPA is common humanity, the minimal to moderate relationship with agreeableness was tentatively expected since agreeableness (altruism, prosocial behavior) may naturally stem from a sense of feeling connected to others (John et al., 2008). The minimal to moderate correlation with conscientiousness was similarly tentatively anticipated, since

BPA involves taking a step back to consider the context of distressing situations and/or emotions and conscientiousness is defined as thinking before acting (John et al., 2008). Lastly, openness and BPA were essentially uncorrelated in both Study 2 and 3, suggesting the constructs are unrelated.

Further psychometric support for the SST-BPA comes from Miller et al. (in press) in the form of postdictive validity, where a bias toward big picture appraisal was trained implicitly, using cognitive bias modification techniques (e.g., MacLeod & Mathews, 2012). A preliminary version of the SST-BPA detected group differences between individuals in the BPA training condition and individuals in a personal/evaluative training condition (i.e., seeing both positive and negative events as reflecting one's general positive or negative personal attributes rather than seeing events in a larger context), with the BPA group unscrambling sentences to form BPA statements more often.

In summary, the studies described above provide preliminary support for the SST-BPA as a useful tool for research on emotion regulation. It may also be useful in applied contexts, although further investigation is needed to support clinical uses. A particular benefit of the SST-BPA is that it does not rely on standard self-report methodology. Performance measures such as the SST-BPA can reveal new facts about the individual not available on the basis of self-report by capturing the mind in action rather than as an object of self-reflection, and therefore can be seen as potentially tapping into different aspects of an individual than self-report measures do (Robinson & Neighbors, 2012).

Self-reported traits, although capturing important continuities in the individual, are relatively insensitive to the moment-to-moment variations in information processing that determine concurrent behavior and experience. A focus on performance measures can fill this gap.

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